



Dr. Mason K. Harrup

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Education

Dr. Mason K. Harrup received his B.S. in Chemistry (1989) from the University of Virginia and his Ph.D. in Chemistry (1996) from Emory University.

Experience and Achievements

Mason spent over one year as a postdoctoral research associate at the University of Michigan studying applied research on industrially relevant applications for genetically engineered microorganisms. His task was to develop hybrid processes that utilize catalytic conversions to transform biosynthesized organics into high-value specialty chemicals. In 1997, Mason came to the INL where he quickly became a Principal Investigator working on a variety of technologies related to the central theme of his research, exploration of transport phenomena through solid matrices.

Dr. Harrup's research interests lie in the areas of synthesis and the investigation of ion transport/ion sequestration phenomena in polymer and composite materials. Recently, his work has focused on both the synthetic aspects and transport properties of novel hybrid nanocomposite materials. Current applications for these materials are as electrolytes for next-generation lithium batteries; biocompatible coatings for advanced medical devices; and advanced catalysts for a variety of traditional and membrane reactor applications. His work also extends to the synthesis of novel liquid and solid-phase extractants for the selective recovery of valuable metals (as ions) for both the mining industry and the nuclear industry. Much of his current attention is focused on the commercialization of some of his licensed, patented advanced electrolytes for next-generation lithium batteries. Now thirty-eight years old, he has fifteen patents issued or pending, fifty publications, and thirty-six presentations in the area of materials science and synthesis in the past fourteen years.

INL'S LIFETIME ACHIEVEMENT AWARD FOR INVENTORSHIP

Patents

- U.S. Patent 6,146,787- Solid Polymer Electrolytes for Primary Lithium/Water Batteries
- U.S. Patent 6,403,755 - Polyesters Containing Phosphazene, Method for Synthesizing Polyesters Containing Phosphazenes
- U.S. Patent 6,544,690 - Self-Doped Molecular Composite Battery Electrolytes
- U.S. Patent 6,576,335 - Solid-Phase Materials for Chelating Metal Ions and the Method of Making and Using Same
- U.S. Patent 7,008,564 - Cured Composite Materials for Reactive Metal Battery Electrolytes